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(71)Applicant : YANO KAZUO

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(72)Inventor : YANO KAZUO

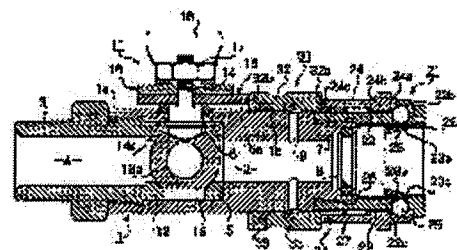
(54) PLUG-IN CONNECTION TYPE PIPE COUPLING DEVICE WITH SHUT-OFF VALVE

(57)Abstract:

PURPOSE: To simplify a connection mechanism and to prevent the malfunction by a method wherein a shut-off valve mechanism and a coupling mechanism are individually arranged, the two mechanisms are interconnected, and a hydraulic purge function on the secondary side is connected when occasion demands.

CONSTITUTION: A plug-in connection type pipe coupling device with an on-off valve comprises a shut-off valve mechanism 11 provided in a pipe coupling body 1 with a shut-off valve 13 consisting of a ball valve to open and close internal flow passages 2 and 4; a coupling mechanism part 21 to which an external male type coupling member 41 is plug-in-connected; and a hydraulic purge mechanism part 31.

The on-off valve mechanism part 11 is provided on an end part, protruded externally of a valve stem 14 formed integrally with the ball valve 13, with a cam plate 15 for malfunction prevention and a valve operation handle 16 at which a valve rotation angle regulating means is disposed. By a cam means 15 interlocking with opening closing operation of the shut-off valve mechanism part 11, during opening operation, constraining lock of the release means 24 of the coupling mechanism part 21 and purge closing of the purge mechanism part 31 are carried out along with opening operation. During closing operation, constraintment release of the release means 24 and purge release of a purge means 32 are conducted along with closing operation.



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CLAIMS

[Claim(s)]

[Claim 1] It is pipe joint equipment which makes plug-in connection of the external male joint member to the female mold joint member prepared in the internal passage of the body of a pipe joint. The closing motion valve-system section equipped with a cam means by which has the closing motion valve which opens and closes said internal passage, and closing motion actuation of this closing motion valve is interlocked with, in said body of a pipe joint, While including the joint device section equipped with an engagement means to hold the connection condition of said male joint member to said female mold joint member, and a release means to cancel maintenance of this engagement means in each With said cam means which coordinates and operates to each actuation of valve opening of said closing motion valve-system section, and clausilium, at the time of valve-opening actuation Plug-in connection mold pipe joint equipment with a closing motion valve characterized by constituting so that a restricted stop of said release means may be doubled with this clausilium actuation to compensate for this valve-opening actuation at the time of nothing and clausilium actuation and restricted discharge of said release means can be made.

[Claim 2] It is pipe joint equipment which makes plug-in connection of the external male joint member to the female mold joint member prepared in the internal passage of the body of a pipe joint. The closing motion valve-system section equipped with a cam means by which has the closing motion valve which opens and closes said internal passage, and closing motion actuation of this closing motion valve is interlocked with, in said body of a pipe joint, The joint device section equipped with an engagement means to hold the connection condition of said male joint member to said female mold joint member, and a release means to cancel maintenance of this engagement means, While including the hydrostatic pressure purge device section equipped with a purge means to purge the secondary hydrostatic pressure in said passage in each With said cam means which coordinates and operates to each actuation of valve opening of said closing motion valve-system section, and clausilium, at the time of valve-opening actuation It doubles with this valve-opening actuation. A restricted stop of said release means and the purge closedown of said purge means at the time of nothing and clausilium actuation Plug-in connection mold pipe joint equipment with a closing motion valve characterized by constituting to compensate for this clausilium actuation so that restricted discharge of said release means and purge disconnection of said purge means can be made.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the plug-in connection mold pipe joint equipment with a closing motion valve constituted so that the plug-in connection and balking of a male joint member to the female mold joint member within the body of a pipe joint which carried out the inner package of the closing motion valve could be easily made in more detail about plug-in connection mold pipe joint equipment with a closing motion valve.

[0002]

[Description of the Prior Art] This conventional kind of plug-in connection mold pipe joint equipment with a closing motion valve is shown in drawing 19 .

[0003] Drawing 19 is whole drawing of longitudinal section cutting into half and showing the outline configuration of the plug-in connection mold pipe joint equipment with a closing motion valve by the conventional example in a connectionless clausilium condition (Johan section) and the connection valve-opening condition (bottom half section).

[0004] Namely, the conventional plug-in connection mold pipe joint equipment with a closing motion valve It has the body 51 of a pipe joint which formed internal passage 51a of the upstream in shaft orientations so that the Johan section configuration shown as a connectionless clausilium condition of drawing 19 may see. In the inner surface which separated step 51b of this body 51 of a pipe joint The valve seat member 52 whose sliding of shaft orientations the seal was carried out by seal ring 52a, and formed valve seat 52b in the inner end-face section, and was enabled, It is fixed by fastening ring 53a. To the inner skin and the peripheral face by the side of a heel, respectively Binding side 53b, While arranging the restricted member 53 which fitted two or more engagement ball 53d in engagement hole 53e of the inside which forms 53c and adjoins these each binding sides 53b and 53c The female mold joint member 54 whose sliding the seal was carried out to the inner skin of the valve seat member 52 by seal ring 54a, and was enabled along with the inner skin of the restricted member 53 is arranged, and the release member 55 whose sliding was enabled along with the outer edge surface side peripheral face of the body 51 of a pipe joint is arranged further.

[0005] Said female mold joint member 54 has valve head 54b with valve seal 54c in an inner end-face side. And free passage passage 54e by which adjoined the outer edge surface side at 54d of connection passage and valve head 54b by which opening was carried out, and opening was carried out to the interior of shaft orientations to the peripheral face side is formed in each. After dashing against the inside by the side of an outer edge surface, forming 54f of steps and preparing seal ring 54g in the outside passage inner surface of 54f of these thrust reliance steps, in the inside by the side of 54h of restricted sides, and an outer edge surface, taper side 54i and an outside are extruded and the outer edge surface is referred to as field 54j. And by making the press spring 56 infix by the peripheral face side between said valve seat members 52, this female mold joint member 54 carries out the pressure welding of the valve seal 54c of valve head 54b to valve seat 52b, contact cutoff that is, in between passage, and it makes 54h of restricted sides an expected clausilium operation contact binding side 53b nothing and simultaneous, and restrains the sliding.

[0006] Said release member 55 has formed press side 55b in the inner skin by the side of the inner end face slant-face-like cam side 55a is formed [inner] in the inside by the side of an outer edge surface, and it connects [inner / inside] at this cam side 55a. And this release member 55 carries out the contact press of the cam side 55a to each engagement ball 53d exposed to the peripheral face of said restricted member 53 in part by making the press spring 57 infix by the inner skin side between the outer edge surfaces of said body 51 of a pipe joint.

[0007] On the other hand, the male joint member 61 by which plug-in connection is made to the female mold joint member 54 within said body 51 of a pipe joint While forming secondary internal passage 61a in shaft orientations so that the bottom half section configuration shown as a connection valve-opening condition of drawing 19 may see Said press side by which dashes and contact press is carried out at 54g of steps 61 from connection edge side b, Engagement slot 61e with which 61d of taper sides contacted by peripheral face 61c by which a seal is carried out by said seal ring 54g, and said taper side 54i, and said each engagement ball 53d are made to engage is formed in each.

[0008] therefore, in the case of the conventional plug-in connection mold pipe joint equipment with a closing motion valve which consists of said configuration, with the Johan section configuration shown as a connectionless clausilium condition of drawing 19 It does not break, if plug-in connection of the male joint member 61 to the female mold joint member 54 is made. With the press spring 56 While said female mold joint member 54 and valve seat member 52 are pressed in the opposite direction of an inner end-face side and an outer edge surface side and 54h of restricted sides of this female mold joint member 54 is contacted by binding side 53b by the side of the inner skin of this restricted member 53 By a pressure welding being carried out to valve seat 52b of the valve seat member 52 in the location where valve seal 54c of this female mold joint member 54 separated from step 51b Are maintaining passage [of both / 51a and 54d] mutual in the clausilium condition, and it sets in this clausilium condition. Knockout side 54j of said female mold joint member 54 extrudes each engagement ball 53d of said restricted member 53 to a periphery side, and makes it expose in part. With and the press spring 57 By the release member 55 being pressed to an outer edge surface side, and making cam side 55a contact an each engagement ball 53d exposed part, this release member 55 is maintained in the clausilium location.

[0009] Then, in the bottom half section configuration shown as a connection valve-opening condition of drawing 19 , expected plug-in connection is made in the state of said connectionless clausilium by resisting the thrust of the press spring 56 from a heel side to the female mold joint member 54 of the body 51 of a pipe joint, and pushing in the male joint member 61.

[0010] First, the connection edge side of the male joint member 61 is inserted in the heel side of said female

mold joint member 54 in the state of said connectionless clausilium. That is, while the seal of the peripheral face 61c is carried out by seal ring 54g by the female mold joint member's 54 dashing and contacting 54g of steps in press side 61b of the male joint member 61, taper side 54i is contacted by 61d of taper sides.

[0011] Subsequently, after said female mold joint member 54 moved to the toe side, and moving until the valve seat member 52 was contacted by step 51b when the thrust of the press spring 56 was resisted, said male joint member 61 was pushed in and it died in the state of this insertion. From valve seat 52b, valve seal 54c estranges, is opened, extrude simultaneously, and it follows on migration of field 54j. After constraint of each engagement ball 53d of the restricted member 53 is dispelled, according to a cam operation of cam side 55a of the release member 55 currently pressed with the press spring 57. While this each engagement ball 53d falls and engages with engagement slot 61e of the male joint member 61. It is what this release member 55 moves to a valve-opening location, and it is held by press side 55b, and cam side 55a is ****(ed) by binding side 53c by the side of a peripheral face, and shifts to a connection valve-opening condition. In the state of this connection valve opening. As the arrow head showed to drawing, a fluid will flow from internal passage 51a of the upstream through secondary free passage passage 54e bordering on a valve portion to 54d of each connection passage secondary [this], and internal passage 61a.

[0012] moreover, to make it shift to a connectionless clausilium condition from said connection valve-opening condition. That what is necessary is to resist the thrust of the press spring 57 and just to move the release member 55 which is moving to said valve-opening location to a clausilium location, by migration in the clausilium location of this release member 55, since the engagement to said engagement ball 53d [each] engagement slot 61e is released. Said female mold joint member 54 returns to the original condition automatically by the thrust of the press spring 56, a clausilium operation is achieved, and the male joint member 61 can be easily sampled from said female mold joint member 54 in the state of this clausilium.

[0013]

[Problem(s) to be Solved by the Invention] however, in the case of the conventional plug-in connection mold pipe joint equipment with a closing motion valve by said configuration. Since the closing motion valve system is united with the female mold joint member and a closing motion valve system exists as the inside of about [that itself of whole structure is complicated extremely] and passage is interrupted. It has the disadvantage of not being smooth, also with the flow of a fluid. In addition, the thing for which the suppression force of the press spring of a valve seat member and a female mold joint member is strongly set up on the need of acquiring an exact clausilium operation, And for the internal pressure concerning the surface integral of a bulb, the pushing resistance of a male joint member to this female mold joint member is powerful, and there is a trouble that plug-in dialing operation is not easy.

[0014] moreover — one side — the release member for connection release — always — release — since it was in an operational condition and a means to purge the secondary hydrostatic pressure which remains in a male joint member was not added when a fault also had **** to release and shifted to a clausilium condition from a valve-opening condition further, there was also a fault of following danger on release actuation.

[0015] The place which it was made in order that this invention might cancel such each conventional trouble, and is make into that object is offer this kind of plug-in connection mold pipe joint equipment with a closing motion valve which prevents an operation mistake and enabled it to acquire the hydrostatic pressure purge operation by the side of secondary connection if needed while attain and combine carrying out smoothly of the flow of a fluid and simplify attachment.

[0016]

[Means for Solving the Problem] In order to attain said object, it makes these both devices coordinate, and achieves an operation mistake prevention function, and may make it make it coordinate a secondary hydrostatic pressure purge function if needed, while the plug-in connection mold pipe joint equipment with a closing motion valve concerning this invention sets a closing motion valve system and a joint device as each **.

[0017] Namely, invention according to claim 1 concerning this invention. It is pipe joint equipment which makes plug-in connection of the external male joint member to the female mold joint member prepared in the internal passage of the body of a pipe joint. The closing motion valve-system section equipped with a cam means by which has the closing motion valve which opens and closes said internal passage, and closing motion actuation of this closing motion valve is interlocked with, in said body of a pipe joint, While including the joint device section equipped with an engagement means to hold the connection condition of said male joint member to said female mold joint member, and a release means to cancel maintenance of this engagement means in each. With said cam means which coordinates and operates to each actuation of valve opening of said closing motion valve-system section, and clausilium, at the time of valve-opening actuation. It is plug-in connection mold pipe joint equipment with a closing motion valve characterized by constituting so that a restricted stop of said release means may be doubled with this clausilium actuation to compensate for this valve-opening actuation at the time of nothing and clausilium actuation and restricted discharge of said

release means can be made.

[0018] Moreover, invention according to claim 2 concerning this invention It is pipe joint equipment which makes plug-in connection of the external male joint member to the female mold joint member prepared in the internal passage of the body of a pipe joint. The closing motion valve-system section equipped with a cam means by which has the closing motion valve which opens and closes said internal passage, and closing motion actuation of this closing motion valve is interlocked with, in said body of a pipe joint, The joint device section equipped with an engagement means to hold the connection condition of said male joint member to said female mold joint member, and a release means to cancel maintenance of this engagement means, While including the hydrostatic pressure purge device section equipped with a purge means to purge the secondary hydrostatic pressure in said passage in each With said cam means which coordinates and operates to each actuation of valve opening of said closing motion valve-system section, and clausilium, at the time of valve-opening actuation It doubles with this valve-opening actuation. A restricted stop of said release means and the purge closedown of said purge means at the time of nothing and clausilium actuation It is plug-in connection mold pipe joint equipment with a closing motion valve characterized by constituting so that restricted discharge of said release means and purge disconnection of said purge means can be made to compensate for this clausilium actuation.

[0019]

[Function] therefore, at the time of valve-opening actuation, it is alike together with this valve-opening actuation in the closing-motion valve-system section by the cam means by which are valve opening and carrying out clausilium actuation, and coordinated actuation is carried out at this, and a restricted stop carries out in a release means, an operation mistake is prevented, it is alike together with this clausilium actuation, and restricted discharge can carry out in a release means at the time of clausilium actuation in the plug-in connection mold pipe joint equipment with a closing-motion valve of this invention according to claim 1.

[0020] Moreover, it sets to the plug-in connection mold pipe joint equipment with a closing motion valve of this invention according to claim 1. To this the closing motion valve-system section by valve opening and carrying out clausilium actuation with the cam means by which coordinated actuation is carried out at the time of valve-opening actuation this valve-opening actuation is resembled together, the restricted stop of the release means is carried out, and an operation mistake is prevented, and the purge closedown of the purge means is carried out, it is alike together with this clausilium actuation at the time of clausilium actuation, and restricted discharge is carried out in a release means, and purge disconnection can be carried out in a purge means.

[0021]

[Example] Hereafter, with reference to drawing 1 thru/or drawing 18 , it explains to a detail about the example of each ** of the plug-in connection mold pipe joint equipment with a closing motion valve concerning this invention.

[0022] The 1st example plant layout drawing 1 thru/or drawing 5 are what shows the 1st fundamental plug-in connection mold pipe joint equipment with a closing motion valve which applied the 1st example of this invention. Drawing 1 Whole drawing of longitudinal section and drawing 2 which show the outline configuration of the clausilium condition by connectionless A side elevation same as the above and drawing 3 are the flat-surface schematic drawing of cam Itabe for operation mistake prevention same as the above, and a side elevation same as the above and drawing 6 of whole drawing of longitudinal section and drawing 5 which show the outline configuration of the valve-opening condition accompanying connection in drawing 4 are the flat-surface schematic drawing of cam Itabe for operation mistake prevention same as the above.

[0023] The closing motion valve-system section in which **** 1 example equipment opens and closes internal passage to the inside of the body of a pipe joint, While including in each the joint device section of a female mold joint member which makes plug-in connection of the male joint member, and the hydrostatic pressure purge device section which purges secondary hydrostatic pressure It coordinates with valve-opening actuation of the closing motion valve-system section. To this valve-opening actuation and coincidence A restricted operation of a male joint member, It enables it to acquire a secondary hydrostatic pressure purge closedown operation, and coordinates with clausilium actuation of the closing motion valve-system section, and it constitutes so that a release operation of a male joint member and a secondary hydrostatic pressure purge disconnection operation can be acquired to this clausilium operation and coincidence.

[0024] That is, in the 1st example equipment shown in drawing 1 thru/or drawing 6 , the plug-in connection mold pipe joint equipment with a closing motion valve consists of the closing motion valve-system section 11 which is incorporated in this body 1 of a pipe joint, respectively, and opens and closes passage, the joint device section 21 which makes plug-in connection of the external male joint member 41, and the hydrostatic pressure purge device section 31 while establishing the body 1 of a pipe joint.

[0025] Said body 1 of a pipe joint corresponds to said closing motion valve-system section 11 side as shown in drawing 1. Hexagon-head tubed, While being formed in the shape of a cylinder corresponding to said joint device section 21 side and the hydrostatic pressure purge device section 31 side and forming the internal passage 2 in the interior of shaft orientations To for example, the toe side which screwed on the communication trunk 3 with which a hydrostatic pressure source of release etc. is equipped The valve boss 6 which carries out opening to hexagon-head cylinder surface 1a of the free passage space 5 and a periphery which is open for free passage to the internal passage 4 of this communication trunk 3 is formed. Moreover, a step 7 is separated to the inside by the side of a heel, a seal ring 8 is formed in it, and two or more purge points 9 which carry out opening in the pars intermedia of said internal passage 4 at cylindrical side 1b of a periphery are formed further.

[0026] Moreover, in the case of **** 1 example, it is incorporated by said closing motion valve-system section 11 in independent in said body 1 of a pipe joint, and the closing motion valve by the ball valve (ball valve) in which switching operation is possible is used for it from the exterior. The valve seat member 12 by which an inner package is carried out fixed into said free passage space 5, and the ball valve member 13 which was fitted in free [rotation] into this valve seat member 12, and formed valve passage 13a in the necessary direction, The valve stem 14 which slit engagement was carried out so that it might rotate to this ball valve member 13, and was taken out from said valve boss 6 outside through valve seal 14a, It has in each the valve actuation handle 16 which allotted the below-mentioned cam plate 15 for operation mistake prevention with which the shank taken out by the exterior of this valve stem 14 is equipped in one through a lock washer etc., and the valve rotation angle regulation means. Unification immobilization of this cam plate 15 for operation mistake prevention and the valve actuation handle 16 has been carried out with the lock nut 17 on said valve stem 14.

[0027] Here as shown in drawing 2 and drawing 3 said cam plate 15 for operation mistake prevention Regulation cam side it connected [regulation] in valve-opening direction of said ball valve member 13 at induction cam side 15a [which imitated], and this induction cam side 15a 15b is formed. Moreover, regulation protruding piece 16a which regulates the rotation angle, i.e., a clausilium location and a valve-opening location, of said ball valve member 13 using hexagon-head cylinder surface 1a of the periphery of said body 1 of a pipe joint as a valve rotation angle regulation means of said valve actuation handle 16 is bent.

[0028] therefore, in the case of the closing motion valve-system section 11 by said configuration, in the state of the connectionless clausilium shown in drawing 1 thru/or drawing 3 While regulation protruding piece 16a of said valve actuation handle 16 rotates to a rectangular location here [the location and here] where it **** to the end side side of hexagon-head cylinder surface 1a and operates said ball valve member 13 in a clausilium location to the direction of an axis of said body 1 of a pipe joint It is moved and held in the non-regulating location where regulation cam side 15b of said cam plate 15 for operation mistake prevention separates from a regulation location, and occupies a right-angle location.

[0029] then, in the state of connection valve opening shown in drawing 4 thru/or drawing 6 To the direction of an axis of said body 1 of a pipe joint here [the location and here] where regulation protruding piece 16a of said valve actuation handle 16 **** to the other end side side of hexagon-head cylinder surface 1a to a parallel location While this valve actuation handle 16 rotates and operating said ball valve member 13 in a valve-opening location, regulation cam side 15b of said cam plate 15 for operation mistake prevention will move to a non-regulating location, and will be held.

[0030] Said joint device section 21 has the restricted member 22 screwed on the heel side of said body 1 of a pipe joint, the female mold joint member 23 fitted in the inner skin of this restricted member 22 free [sliding], and the release member 24 fitted in the peripheral face of this restricted member 22 free [sliding] as shown in drawing 1.

[0031] Here, two or more engagement balls 25 are fitted in said restricted member 22 at engagement hole 22c of the inside which has formed the binding sides 22a and 22b in the inner skin inside and the peripheral face inside by the side of a heel, respectively, and adjoins these each binding sides 22a and 22b.

[0032] Moreover, said female mold joint member 23 is making annular [which formed restricted side 23a in the outer edge surface, and extruded to inner skin at taper side 23b and a peripheral face, and formed field 23c in each]. And while making restricted side 23a contact binding side 22a of said restricted member 22 and restraining the sliding by making the press spring 26 infix by the peripheral face side between the outer edge surfaces of said body 1 of a pipe joint, extrusion side 54j extrudes each engagement ball 25 of said restricted member 53 to a periphery side, and makes this female mold joint member 23 expose it in part. In addition, about said press spring 26 which adds a press operation to this female mold joint member 23 in this case, it does not serve as the closedown of a valve portion like [in the former which stated previously], and since it is only oppressing only this female mold joint member 23, it is not necessary to hold powerful thrust.

[0033] Furthermore, said release member 24 forms press side 24b in the inner skin by the side of the inner end face slant-face-like cam side 24a is formed [inner] in the inside by the side of an outer edge surface,

and it connects [inner / inside] at this cam side 24a, and has formed toe edge 24c in the inner end face, respectively. And this release member 24 carries out the contact press of the cam side 24a to each engagement ball 25 exposed to the periphery side of said restricted member 22 in part by making the press spring 27 infix by the inner skin side between the outer edge surfaces of said body 1 of a pipe joint.

[0034] On the other hand, the male joint member 41 by which plug-in connection is made at the female mold joint member 23 within said body 1 of a pipe joint has formed in each engagement slot 41c with which taper side 41b contacted by peripheral face 41a by which a seal is carried out with said seal ring 8, and said taper side 23b, and said each engagement ball 25 are made to engage from the connection edge side while forming the secondary internal passage 42 in the shaft-orientations inside as shown at drawing 3.

[0035] therefore, in the case of the joint device section 21 by said configuration, in the state of the connectionless clausilium shown in drawing 1 thru/or drawing 3 While it does not break if plug-in connection of the male joint member 41 to the female mold joint member 23 is made, but restricted side 23a of said female mold joint member 23 is contacted with the press spring 26 by binding side 22a by the side of the inner skin of the restricted member 22 Knockout side 23c extrudes each engagement ball 25 of said restricted member 22 to a periphery side, and exposes it in part. With and the press spring 27 By the release member 24 being pressed to an outer edge surface side, and making cam side 24a contact the exposed part of each engagement ball 25, this release member 24 is maintained in the clausilium location.

[0036] then, in the state of connection valve opening shown in drawing 4 thru/or drawing 6 By resisting the thrust of the press spring 26 from a heel side to the female mold joint member 23 in said connectionless clausilium condition, and pushing in the connection edge side of the male joint member 41 While the seal of the peripheral face 41a of this male joint member 41 is carried out with the seal ring 8 within said body 1 of a pipe joint and taper side 41b is contacted by taper side 23b of said female mold joint member 23 After constraint of each engagement ball 25 of said restricted member 22 is dispelled with migration of knockout side 23c of this female mold joint member 23, according to a cam operation of cam side 24a of the release member 24 currently pressed with the press spring 27 This each engagement ball 25 falls and engages with engagement slot 41c of said male joint member 41. And it is what this release member 24 moves to a valve-opening location, it is held by press side 24b, and cam side 24a is further ****(ed) by binding side 22b by the side of a peripheral face, and shifts to a connection valve-opening condition. In this connection valve-opening condition, a fluid will flow from the upstream of the internal passage 2 to the internal passage 42 secondary [this] through secondary [which separated the valve portion].

[0037] moreover, again from said connection valve-opening condition to make it shift to a connectionless clausilium condition That what is necessary is to resist the thrust of the press spring 27 and just to move the release member 24 which is moving to said valve-opening location to a clausilium location, by migration in the clausilium location of this release member 24, since the engagement to engagement slot 41c of each of said engagement ball 25 is released Said female mold joint member 23 returns to the original condition automatically by the thrust of the press spring 26, a clausilium operation is achieved, and the male joint member 41 can be easily sampled from said female mold joint member 23 in the state of this clausilium.

[0038] Next, while said hydrostatic pressure purge device section 31 is fitted in for the cylindrical side 1b top of said body 1 of a pipe joint, enabling free sliding It is on inner skin and said each purge point 9 is straddled in the state of said connection valve opening. A peripheral surface seal Nothing, Have the tubed purge member 32 which formed the seal ring 33 of a lot in said location which cancels this peripheral surface seal in the state of connectionless clausilium, and outer edge marginal 32a of the outer edge surface side in this tubed purge member 32 and in the state of said connection valve opening The contact to toe edge 24c of said release member 24 is enabled. Toe edge 32b of an inner end-face side in the state of said connectionless clausilium After being guided to the cam plate 15 for operation mistake prevention interlocked with said valve actuation handle 16 and moving, it is contacted by regulation cam side 15b, and is held in this migration location.

[0039] therefore, in the case of the hydrostatic pressure purge device section 31 by said configuration, in the state of the connectionless clausilium shown in drawing 1 thru/or drawing 3 Since it does not break if plug-in connection of the male joint member 41 to the female mold joint member 23 is made, but the release member 24 is maintained in the clausilium location Since it does not break if the peripheral surface seal of each purge point 9 by each seal ring 33 of the tubed purge member 32 is made, but the valve actuation handle 16 is in a clausilium location, regulation by regulation cam side 15b of the cam plate 15 for operation mistake prevention has not been received, either.

[0040] moreover, in the state of connection valve opening shown in drawing 4 thru/or drawing 6 Because plug-in connection of the male joint member 41 to said female mold joint member 23 is made and said valve actuation handle 16 operates in a valve-opening location said tubed purge member 32 While being guided to said cam plate 15 for operation mistake prevention and being moved to an expected location It will be regulated by regulation cam side 15b, the peripheral surface seal of each purge point 9 by each seal ring 33

will be made, said release member 24 will be simultaneously moved and restrained by the valve-opening location, and an operation mistake prevention operation will be achieved.

[0041] As mentioned above, it sets to the plug-in connection mold pipe joint equipment with a closing motion valve by the **** 1 example configuration. If plug-in connection of the male joint member 41 to the female mold joint member 23 of the body 1 of a pipe joint is made If maintenance of the connection condition by engagement constraint of the joint device section 21 is made and valve-opening actuation of the closing motion valve-system section 11 is carried out in the state of this connection to this male joint member 41 While between the internal passage 2 within said body 1 of a pipe joint and the interior passage 42 of secondary in the male joint member 41 is opened for free passage and shifting to a valve-opening condition By coordinating with valve-opening actuation of this closing motion valve-system section 11, and restricted actuation of the hydrostatic pressure purge device section 31 being made The closedown of the purge operation in said interior passage of secondary is carried out automatically, it combines, and unless the connection condition of said joint device section 21 will also be restrained automatically and carries out clausilium actuation of said closing motion valve-system section 11 henceforth simultaneously, release of this connection condition is made impossible.

[0042] Moreover, if clausilium actuation of said closing motion valve-system section 11 is carried out with said valve-opening condition, while between the internal passage 2 within said body 1 of a pipe joint and the interior passage 42 of secondary in the male joint member 41 will be intercepted and shifting to a clausilium condition By coordinating with this clausilium actuation and restricted release of said hydrostatic pressure purge device section 31 being made, if it operates and this hydrostatic pressure purge device section 31 pulls By attaining both actuation of said joint device section 21, consequently carrying out release actuation of said joint device section 21 After said hydrostatic pressure purge device section 31 also operates automatically and the purge operation in said interior passage of secondary is achieved simultaneously, said male joint member 41 can be sampled very easily from said female mold joint member 23.

[0043] The 2nd example plant layout drawing 7 and drawing 8 show the plug-in connection mold pipe joint equipment with a closing motion valve which applied the 2nd example of this invention, drawing 7 is whole drawing of longitudinal section showing the outline configuration of the clausilium condition by connectionless, and drawing 8 is whole drawing of longitudinal section showing the outline configuration of the valve-opening condition accompanying connection.

[0044] **** 2 example equipment crosses the inside of said internal passage 2 in a cock type closing motion valve, i.e., this case, in said closing motion valve-system section 11 in the configuration of said 1st example equipment, and the same or, almost same operation effectiveness as the 1st example equipment is acquired using the cock-like valve element member 18 with valve passage 18a.

[0045] The 3rd example plant layout drawing 9 thru/or drawing 14 are what shows the 2nd fundamental plug-in connection mold pipe joint equipment with a closing motion valve which applied the 3rd example of this invention. Drawing 9 Whole drawing of longitudinal section and drawing 10 which show the outline configuration of the clausilium condition by connectionless A side elevation same as the above and drawing 11 are the flat-surface schematic drawing of cam Itabe for operation mistake prevention same as the above, and a side elevation same as the above and drawing 14 of whole drawing of longitudinal section and drawing 13 which show the outline configuration of the valve-opening condition accompanying connection in drawing 12 are the flat-surface schematic drawing of cam Itabe for operation mistake prevention same as the above.

[0046] **** 3 example equipment omits said hydrostatic pressure purge device section 31 in the configuration of said 1st example equipment, and enables it to make restricted regulation of said male joint member 41 by said closing motion valve-system section 11 at the time of the valve-opening actuation, and the operation effectiveness by said hydrostatic pressure purge device section 31 is not acquired, and also the same operation effectiveness as the 1st example equipment is acquired.

[0047] The 4th example plant layout drawing 15 and drawing 16 show the plug-in connection mold pipe joint equipment with a closing motion valve which applied the 4th example of this invention, drawing 13 is whole drawing of longitudinal section showing the outline configuration of the clausilium condition by connectionless, and drawing 14 is whole drawing of longitudinal section showing the outline configuration of the valve-opening condition accompanying connection.

[0048] While **** 4 example equipment crosses the inside of said internal passage 2 in said closing motion valve-system section 11 in a cock type closing motion valve, i.e., this case, and uses the cock-like valve element member 18 with valve passage 18a for it in the configuration of said 1st example equipment Said hydrostatic pressure purge device section 31 is omitted. By and said closing motion valve-system section 11 Enable it to make restricted regulation of said male joint member 41 at the time of the valve-opening actuation, and the operation effectiveness by said hydrostatic pressure purge device section 31 is not acquired, and also the same or, almost same operation effectiveness as the 1st example equipment is acquired.

[0049] The 5th example plant layout drawing 17 and drawing 18 show the plug-in connection mold pipe joint equipment with a closing motion valve which applied the 5th example of this invention, drawing 15 is whole drawing of longitudinal section showing the outline configuration of the clausilium condition by connectionless, and drawing 16 is whole drawing of longitudinal section showing the outline configuration of the valve-opening condition accompanying connection.

[0050] While **** 5 example equipment crosses the inside of said free passage space 5 in said closing motion valve-system section 11 in a butterfly type closing motion valve, i.e., this case, and uses the butterfly-like valve element member 19 for it in the configuration of said 1st example equipment Said hydrostatic pressure purge device section 31 is omitted. By and said closing motion valve-system section 11 Enable it to make restricted regulation of said male joint member 41 at the time of the valve-opening actuation, and the operation effectiveness by said hydrostatic pressure purge device section 31 is not acquired, and also the same or, almost same operation effectiveness as the 1st example equipment is acquired.

[0051]

[Effect of the Invention] As mentioned above, as explained in full detail according to each example, according to this invention, it sets to the female mold joint member prepared in the internal passage of the body of a pipe joint to the pipe joint equipment which makes plug-in connection of the external male joint member. The closing motion valve-system section equipped with a cam means by which has the closing motion valve which opens and closes internal passage, and closing motion actuation of this closing motion valve is interlocked with, in the body of a pipe joint, If the joint device section equipped with an engagement means to hold the connection condition of the male joint member to a female mold joint member, and a release means to cancel maintenance of this engagement means is incorporated and constituted and the need is accepted Incorporate and constitute the hydrostatic pressure purge device section which equipped this configuration with a purge means to purge the secondary hydrostatic pressure in passage, and with the cam means by which coordinated actuation is carried out to each actuation of valve opening of the closing motion valve-system section, and clausilium If it is at the time of valve-opening actuation, and it is about nothing and the purge closedown of a purge means in a restricted stop of a release means to compensate for valve-opening actuation at the time of nothing and clausilium actuation Since it enabled it to make nothing and purge disconnection of a purge means for restricted discharge of a release means to compensate for clausilium actuation Valve opening of the internal passage by the closing motion valve-system section, clausilium, and connection maintenance of the male joint member to the female mold joint member by the joint device section, It is independent-like [mutual] about each operation with each operation with connection release and the purge closedown of the secondary hydrostatic pressure by the hydrostatic pressure purge device section, and purge disconnection. In relation to mutual, it can carry out automatically. Moreover, and with an independence--in this way configuration On the whole, can simplify each structure of each of this device section, and the actuation itself becomes very easy. Especially, the above operating physical force is not needed by the connection maintenance of a male joint member to the female mold joint member of the joint device section, and connection release, but it has the features which were [make / this actuation / by few operating physical forces / smoothly and promptly] excellent.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is whole drawing of longitudinal section showing the outline configuration of the connectionless clausilium condition of the 1st fundamental plug-in connection mold pipe joint equipment with a closing motion valve which applied the 1st example of this invention.

[Drawing 2] It is the side elevation of the connectionless clausilium condition in the 1st example of the same as the above.

[Drawing 3] It is the flat-surface schematic drawing of cam Itabe for operation mistake prevention in the connectionless clausilium condition in the 1st example of the same as the above.

[Drawing 4] It is drawing of longitudinal section showing the outline configuration of the connection valve-opening condition in the 1st example of the same as the above.

[Drawing 5] It is the side elevation of the connection valve-opening condition in the 1st example of the same as the above.

[Drawing 6] It is the flat-surface schematic drawing of cam Itabe for operation mistake prevention in the connection valve-opening condition in the 1st example of the same as the above.

[Drawing 7] It is whole drawing of longitudinal section showing the outline configuration of the connectionless clausilium condition of the plug-in connection mold pipe joint equipment with a closing motion valve which applied the 2nd example of this invention.

[Drawing 8] It is whole drawing of longitudinal section showing the outline configuration of the connection valve-opening condition in the 2nd example of the same as the above.

[Drawing 9] It is whole drawing of longitudinal section showing the outline configuration of the connectionless clausilium condition of the 2nd fundamental plug-in connection mold pipe joint equipment with a closing motion valve which applied the 3rd example of this invention.

[Drawing 10] It is the side elevation of the connectionless clausilium condition in the 3rd example of the same as the above.

[Drawing 11] It is the flat-surface schematic drawing of cam Itabe for operation mistake prevention in the connectionless clausilium condition in the 3rd example of the same as the above.

[Drawing 12] It is whole drawing of longitudinal section showing the outline configuration of the connection valve-opening condition in the 3rd example of the same as the above.

[Drawing 13] It is the side elevation of the connection valve-opening condition in the 3rd example of the same as the above.

[Drawing 14] It is the flat-surface schematic drawing of cam Itabe for operation mistake prevention in the connection valve-opening condition in the 1st example of the same as the above.

[Drawing 15] It is whole drawing of longitudinal section showing the outline configuration of the connectionless clausilium condition of the plug-in connection mold pipe joint equipment with a closing motion valve which applied the 4th example of this invention.

[Drawing 16] It is whole drawing of longitudinal section showing the outline configuration of the connection valve-opening condition in the 4th example of the same as the above.

[Drawing 17] It is whole drawing of longitudinal section showing the outline configuration of the connectionless clausilium condition of the plug-in connection mold pipe joint equipment with a closing motion valve which applied the 5th example of this invention.

[Drawing 18] It is whole drawing of longitudinal section showing the outline configuration of the connection valve-opening condition in the 5th example of the same as the above.

[Drawing 19] It is whole drawing of longitudinal section cutting into half and showing the outline configuration of the plug-in connection mold pipe joint equipment with a closing motion valve by the conventional example in a connectionless clausilium condition and the connection valve-opening condition.

[Description of Notations]

1 Body of Pipe Joint

1a Hexagon-head cylinder surface

1b Cylindrical side

2 Four Internal passage

3 Communication Trunk

5 Free Passage Space

6 Valve Boss

7 Step

8 Seal Ring

9 Purge Point

11 Closing Motion Valve-System Section

12 Valve Seat Member

13 Ball Valve Member

13a Valve passage

14 Valve Stem

14a Valve seal

15 Cam Plate for Operation Mistake Prevention

15a Induction cam side
 15b Regulation cam side
 16 Valve Actuation Handle
 16a Regulation protruding piece
 17 Lock Nut
 18 Cock-like Valve Element Member
 18a Valve passage
 19 Butterfly-like Valve Element Member
 21 Joint Device Section
 22 Restricted Member
 22a, 22b Binding side
 22c Engagement hole
 23 Female Mold Joint Member
 23a Restricted side
 23b Taper side
 23c Knockout side
 24 Release Member
 24a Cam side
 24b Press side
 24c Toe edge
 25 Engagement Ball
 26 27 Press spring
 31 Hydrostatic Pressure Purge Device Section
 32 Tubed Purge Member
 32a Outer edge edge
 32b Toe edge
 33 Seal Ring
 41 Male Joint Member
 41a Peripheral face
 41b Taper side
 41c Engagement slot
 42 Internal Passage

[Translation done.]

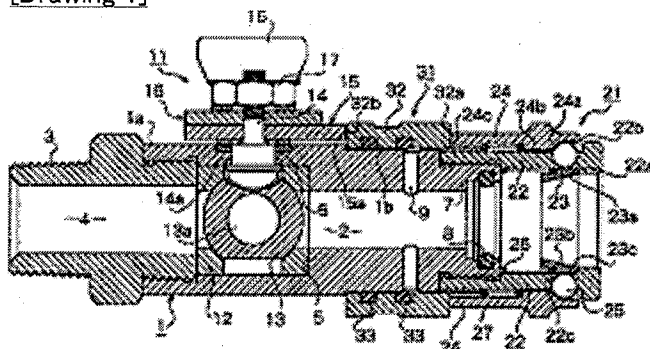
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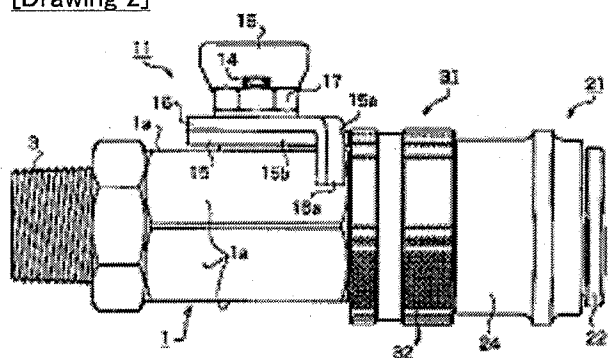
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DRAWINGS

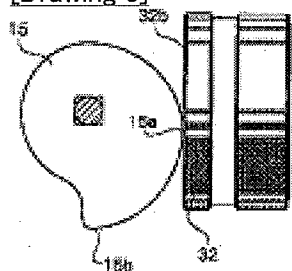
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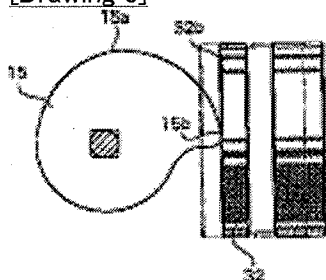
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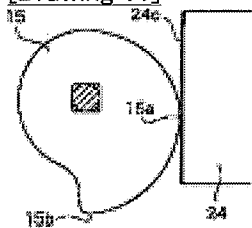
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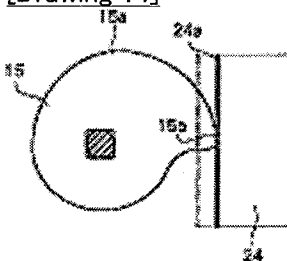
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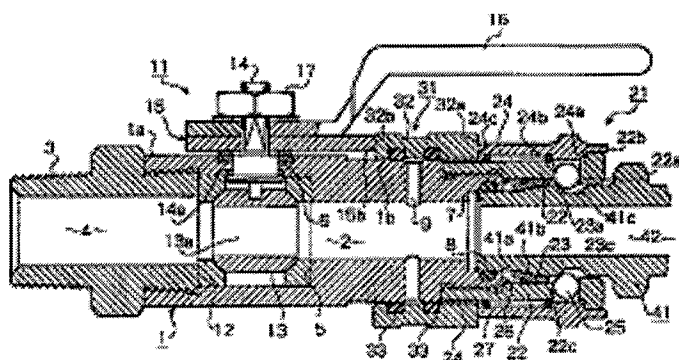
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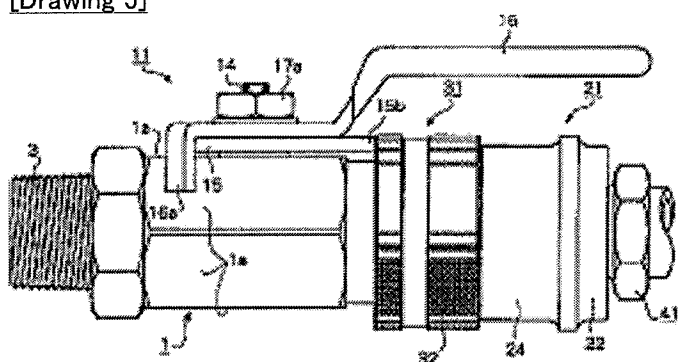
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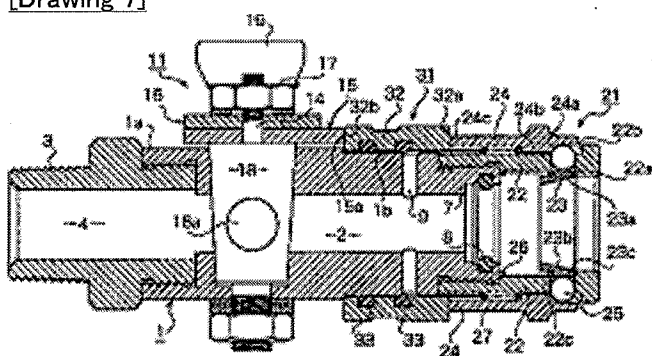
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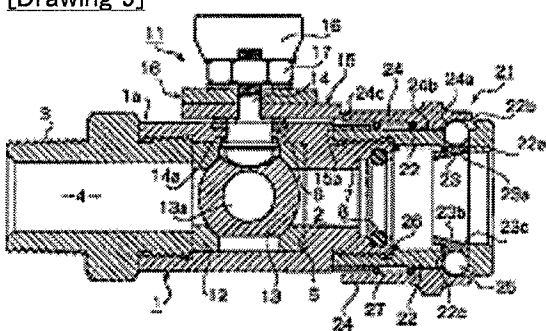
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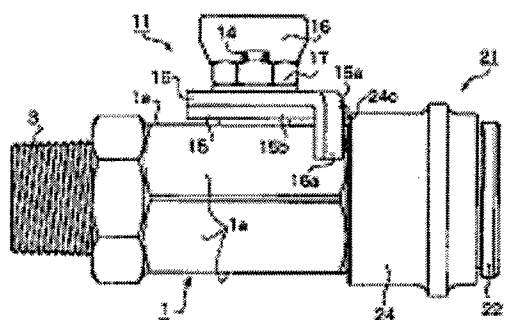
[Drawing 7]



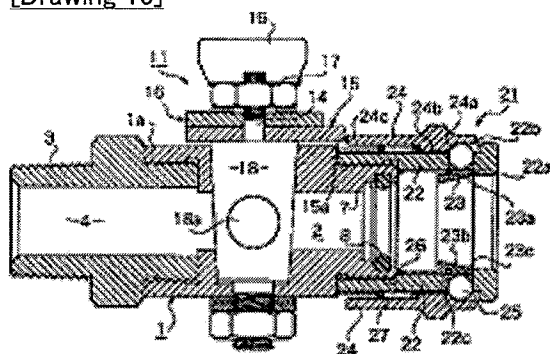
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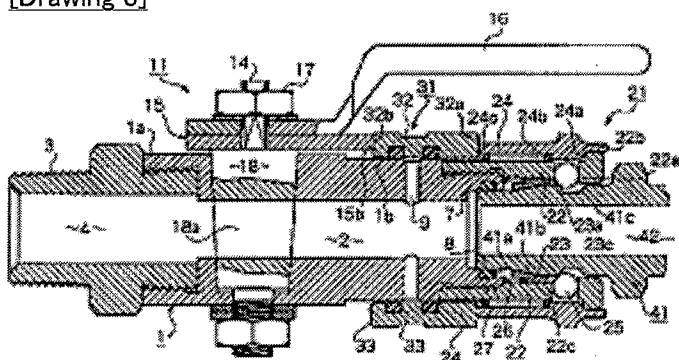
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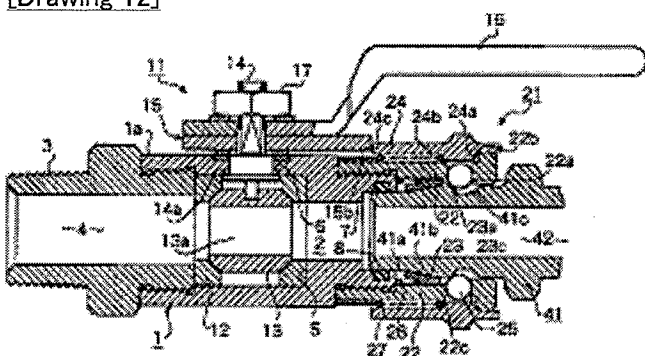
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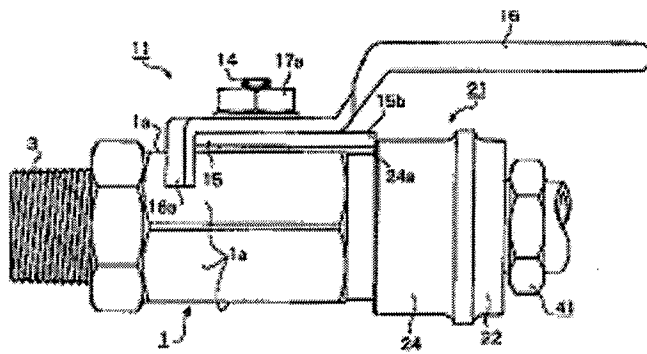
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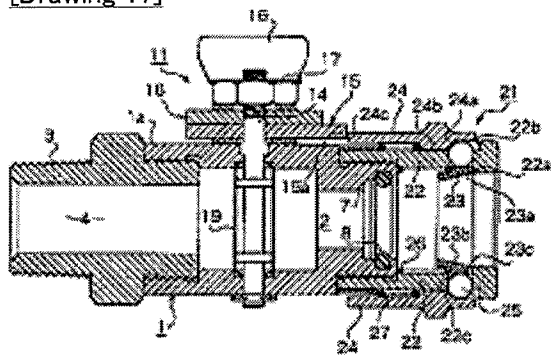
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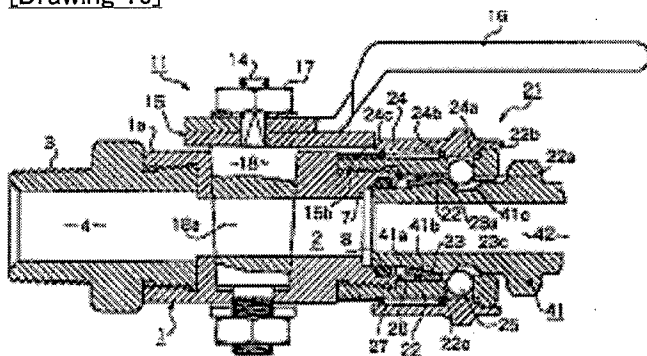
[Drawing 13]



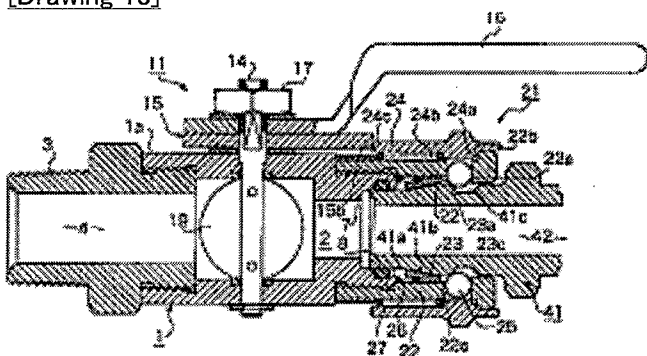
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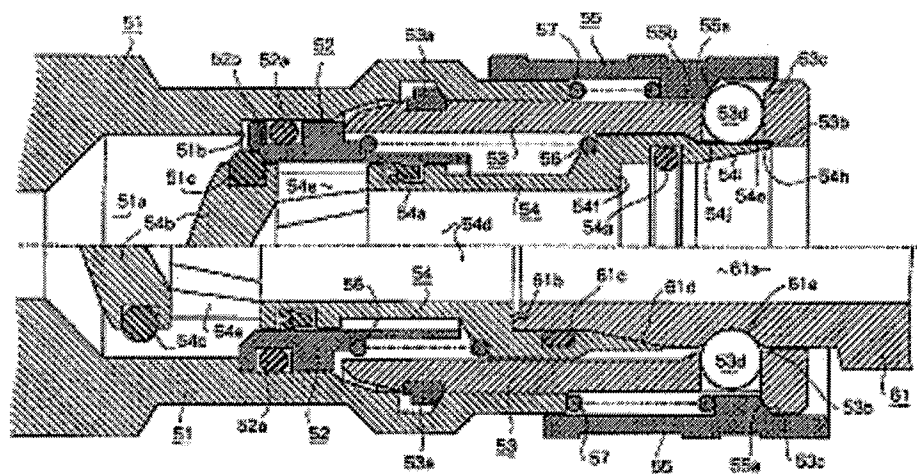
[Drawing 16]



[Drawing 18]



[Drawing 19]



[Translation done.]

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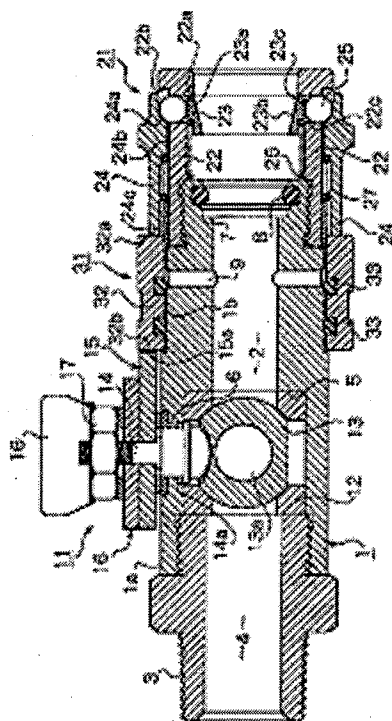
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(71)【出願人】
【識別番号】000246033
【氏名又は名称】矢野 和男
【住所又は居所】東京都大田区南雪谷3-12-6
(72)【発明者】
【氏名】矢野 和男
【住所又は居所】東京都大田区南雪谷3-12-6
(74)【代理人】
【弁理士】
【氏名又は名称】川崎 隆夫

要約

(57)【要約】
【目的】流体の流れの円滑化を図り、併せて、接続機構を簡略化すると共に、誤操作を防止し、必要に応じて接続側での流体圧パージ作用を得られるようにした開閉弁付きプラグイン接続型管継手装置を提供すること。
【構成】管継手本体1内に、内部流路2、4を開閉する開閉弁13、17を有し、且つ該開閉弁13、17の開閉作動に連動するカム手段15を備えた開閉弁機構部11と、雌型継手部材23への雄型継手部材41の接続状態を保持する係合手段25、及び該係合手段25の保持を解除する解放手段24を備えた継手機構部21と、流路2内の二次側流体圧をパージするパージ手段32を備えた流体圧パージ機構部31とをそれぞれに組み込むと共に、開閉弁機構部11の開弁、閉弁の各操作に連繋して作動されるカム手段15により、開弁操作時には、該開弁作動に合わせて解放手段24の拘束係止、及びパージ手段32のパージ閉止をなし、閉弁操作時には、該閉弁作動に合わせて解放手段24の拘束解除、及びパージ手段32のパージ開放をなし得るように構成する。



請求の範囲

【特許請求の範囲】

【請求項1】管継手本体の内部流路に設けられる雌型継手部材に対し、外部の雄型継手部材をプラグイン接続させる管継手装置であって、前記管継手本体に、前記内部流路を開閉する開閉弁を有し、且つ該開閉弁の開閉作動に連動するカム手段を備えた開閉弁機構部と、前記雌型継手部材への前記雄型継手部材の接続状態を保持する係合手段、及び該係合手段の保持を解除する解放手段を備えた継手機構部とをそれぞれに組み込むと共に、前記開閉弁機構部の開弁、閉弁の各操作に連繋して作動される前記カム手段により、開弁操作時には、該開弁作動に合わせて前記解放手段の拘束係止をなし、閉弁操作時には、該閉弁作動に合わせて前記解放手段の拘束解除をなし得るように構成したことを特徴とする開閉弁付きプラグイン接続型管継手装置。

【請求項2】管継手本体の内部流路に設けられる雌型継手部材に対し、外部の雄型継手部材をプラグイン接続させる管継手装置であって、前記管継手本体に、前記内部流路を開閉する開閉弁を有し、且つ該開閉弁の開閉作動に連動するカム手段を備えた開閉弁機構部と、前記雌型継手部材への前記雄型継手部材の接続状態を保持する係合手段、及び該係合手段の保持を解除する解放手段を備えた継手機構部と、前記流路内の二次側流体圧をパージするパージ手段を備えた流体圧パージ機構部とをそれぞれに組み込むと共に、前記開閉弁機構部の開弁、閉弁の各操作に連繋して作動される前記カム手段により、開弁操作時には、該開弁作動に合わせて、前記解放手段の拘束係止、及び前記パージ手段のパージ閉止をなし、閉弁操作時には、該閉弁作動に合わせて、前記解放手段の拘束解除、及び前記パージ手段のパージ開放をなし得るように構成したことを特徴とする開閉弁付きプラグイン接続型管継手装置。

詳細な説明

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、開閉弁付きプラグイン接続型管継手装置に関し、さらに詳しくは、開閉弁を内装した管継手本体の雌型継手部材に対する雄型継手部材のプラグイン接続及び離脱を容易になし得るように構成した開閉弁付きプラグイン接続型管継手装置に係るものである。

【0002】

【従来技術】従来のこの種の開閉弁付きプラグイン接続型管継手装置を図19に示す。

【0003】図19は、従来例による開閉弁付きプラグイン接続型管継手装置の概要構成を非接続閉弁状態(上半部)と接続開弁状態(下半部)とに半截して示す全体縦断面図である。

【0004】即ち、従来の開閉弁付きプラグイン接続型管継手装置は、図19の非接続閉弁状態として示す上半部構成に見られるように、軸方向に一次側の内部流路51aを形成した管継手本体51を有しており、該管継手本体51の段部51bを隔てた内面には、シールリング52aでシールされ、且つ内端面部に弁座52bを形成して

軸方向に摺動可能にされた弁座部材52と、繫止リング53aで固定されて、外端部側の内周面と外周面とにそれぞれ押止面53b、53cを形成し、且つ該各押止面53b、53cに隣接する内側の係合穴53eに複数の係合ボール53dを嵌挿した拘束部材53とを配置すると共に、弁座部材52の内周面にシールリング54aでシールされ、且つ拘束部材53の内周面に沿って摺動可能にされた雌型継手部材54を配置してあり、さらに、管継手本体51の外端面側外周面に沿って摺動可能にされた解放部材55を配置してある。

【0005】前記雌型継手部材54は、内端面側に弁シール54c付きの弁頭部54bを有し、且つ軸方向内部に外端面側へ開口された接続流路54d及び弁頭部54bに隣接して外周面側へ開口された連通流路54eをそれぞれに形成してあって、外端面側の内側に突き当て段部54fを形成し、該突き当て段部54fの外側流路内面にシールリング54gを設けた上で、外端面を拘束面54h、外端面側の内側をテーパ面54i、外側を押し出し面54jとしてある。そして、本雌型継手部材54は、前記弁座部材52との間に外周面側で押圧バネ56を介装させることにより、弁頭部54bの弁シール54cを弁座52bに圧接して流路相互間を遮断、つまり、所期の閉弁作用をなし、同時に拘束面54hを押止面53bに当接させて、その摺動を拘束する。

【0006】前記解放部材55は、外端面側の内側に斜面状のカム面55aを形成し、且つ該カム面55aに接続する内端面側の内周面に押圧面55bを形成してある。そして、本解放部材55は、前記管継手本体51の外端面との間に内周面側で押圧バネ57を介装させることにより、前記拘束部材53の外周面に一部露出される各係合ボール53dに対してカム面55aを当接押圧する。

【0007】一方、前記管継手本体51内での雌型継手部材54にプラグイン接続される雄型継手部材61は、図19の接続開弁状態として示す下半部構成に見られるように、軸方向に二次側の内部流路61aを形成すると共に、接続端部側から、前記突き当て段部54gに当接押圧される押圧面61b、前記シールリング54gでシールされる外周面61c、前記テーパ面54iに当接されるテーパ面61d及び前記各係合ボール53dに係合させる係合溝61eをそれぞれに形成してある。

【0008】従って、前記構成からなる従来の開閉弁付きプラグイン接続型管継手装置の場合、図19の非接続閉弁状態として示す上半部構成では、雌型継手部材54に対する雄型継手部材61のプラグイン接続がなされてはならず、押圧バネ56により、前記雌型継手部材54と弁座部材52とが内端面側と外端面側との相反する方向へ押圧されて、該雌型継手部材54の拘束面54hが該拘束部材53の内周面側の押止面53bに当接されると共に、該雌型継手部材54の弁シール54cが段部51bから離れた位置で弁座部材52の弁座52bに圧接されることで、両者の流路51a、54dの相互間を閉弁状態に維持しており、また、この閉弁状態において、前記雌型継手部材54の押し出し面54jが、前記拘束部材53の各係合ボール53dを外周側に押し出して一部露出させ、且つ押圧バネ57により、解放部材55が外端面側へ押圧されてカム面55aを各係合ボール53dの露出部分に当接させることで、該解放部材55を閉弁位置に維持している。

【0009】続いて、図19の接続開弁状態として示す下半部構成においては、前記非接続閉弁状態で管継手本体51の雌型継手部材54に対して、外端部側から押圧バネ56の押圧力に抗し、雄型継手部材61を押し込むことにより、所期のプラグイン接続がなされる。

【0010】先ず、前記非接続閉弁状態で、前記雌型継手部材54の外端部側に雄型継手部材61の接続端部側を挿入する。つまり、雌型継手部材54の突き当て段部54gに雄型継手部材61の押圧面61bを当接することにより、外周面61cがシールリング54gでシールされると共に、テーパ面61dにテーパ面54iが当接される。

【0011】次いで、この挿入状態で、前記雄型継手部材61を押圧バネ56の押圧力に抗して押し込んでゆくと、前記雌型継手部材54が内端部側に移動し、且つ弁座部材52が段部51bに当接されるまで移動した上で、弁座52bから弁シール54cが離間して開弁され、同時に押し出し面54jの移動に伴って、拘束部材53の各係合ボール53dの拘束が解かれた後、押圧バネ57で押圧されている解放部材55のカム面55aのカム作用により、該各係合ボール53dが雄型継手部材61の係合溝61eに落ち込んで係合されると共に、該解放部材55が開弁位置に移動して押圧面55bで保持され、且つカム面55aが外周面側の押止面53cに衝接されて接続開弁状態に移行するもので、この接続開弁状態では、図に矢印で示したように、流体は、一次側の内部流路51aから、弁部を境界にした二次側の連通流路54eを経て、同二次側の各接続流路54d、内部流路61aに流れることになる。

【0012】また、前記接続開弁状態から非接続閉弁状態に移行させるのには、前記開弁位置に移動している解放部材55を押圧バネ57の押圧力に抗して閉弁位置に移動させればよく、該解放部材55の閉弁位置への移動によって、前記各係合ボール53dの係合溝61eへの係合が解放されるために、前記雌型継手部材54が押圧バネ56の押圧力で自動的に元の状態に復帰して閉弁作用が果たされるのであり、該閉弁状態では、前記雌型継手部材54から雄型継手部材61を容易に抜き取り得るのである。

【0013】

【発明が解決しようとする課題】しかしながら、前記構成による従来の開閉弁付きプラグイン接続型管継手装置の場合には、開閉弁機構が雌型継手部材に一体化されているために、全体構造のそれ自体が極めて複雑化するばかりか、流路内をさえぎるようにして開閉弁機構が存在するので、流体の流れにも円滑さを欠くという不利を有しており、且つこれに加えて、的確な閉弁作用を得る必要上、弁座部材と雌型継手部材との押圧バネの弾圧力を強く設定していること、ならびにバルブの面積分にかかる内圧のため、該雌型継手部材に対する雄型継手部材の押し込み抵抗が強力であって、プラグイン接続操作が容易でないという問題点がある。

【0014】また一方では、接続解除のための解放部材が常に解放操作可能な状態にあるために、過って解放し

てしまう恐れもあり、さらには、開弁状態から閉弁状態に移行する際に、雄型継手部材内に残留している二次側の流体圧をパージする手段が付加されていないので、解放操作に危険性を伴うという欠点もあった。

【0015】本発明は、このような従来の各問題点を解消するためになされたもので、その目的とするところは、流体の流れの円滑化を図り、併せて、接続機構を簡略化すると共に、誤操作を防止し、必要に応じて二次接続側での流体圧パージ作用を得られるようにした、この種の開閉弁付きプラグイン接続型管継手装置を提供することである。

【0016】

【課題を解決するための手段】前記目的を達成するために、本発明に係る開閉弁付きプラグイン接続型管継手装置は、開閉弁機構と継手機構とを各別に設定すると共に、該両機構を連繋させて誤操作防止機能を果たし、且つ必要に応じて二次側の流体圧パージ機能を連繋させ得るようにしたものである。

【0017】即ち、本発明に係る請求項1に記載の発明は、管継手本体の内部流路に設けられる雌型継手部材に対し、外部の雄型継手部材をプラグイン接続させる管継手装置であって、前記管継手本体内に、前記内部流路を開閉する開閉弁を有し、且つ該開閉弁の開閉作動に連動するカム手段を備えた開閉弁機構部と、前記雌型継手部材への前記雄型継手部材の接続状態を保持する係合手段、及び該係合手段の保持を解除する解放手段を備えた継手機構部とをそれぞれに組み込むと共に、前記開閉弁機構部の開弁、閉弁の各操作に連繋して作動される前記カム手段により、開弁操作時には、該開弁作動に合わせて前記解放手段の拘束係止をなし、閉弁操作時には、該閉弁作動に合わせて前記解放手段の拘束解除をなし得るように構成したことを特徴とする開閉弁付きプラグイン接続型管継手装置である。

【0018】また、本発明に係る請求項2に記載の発明は、管継手本体の内部流路に設けられる雌型継手部材に対し、外部の雄型継手部材をプラグイン接続させる管継手装置であって、前記管継手本体内に、前記内部流路を開閉する開閉弁を有し、且つ該開閉弁の開閉作動に連動するカム手段を備えた開閉弁機構部と、前記雌型継手部材への前記雄型継手部材の接続状態を保持する係合手段、及び該係合手段の保持を解除する解放手段を備えた継手機構部と、前記流路内の二次側流体圧をパージするパージ手段を備えた流体圧パージ機構部とをそれぞれに組み込むと共に、前記開閉弁機構部の開弁、閉弁の各操作に連繋して作動される前記カム手段により、開弁操作時には、該開弁作動に合わせて前記解放手段の拘束係止、及び前記パージ手段のパージ閉止をなし、閉弁操作時には、該閉弁作動に合わせて前記解放手段の拘束解除、及び前記パージ手段のパージ開放をなし得るように構成したことを特徴とする開閉弁付きプラグイン接続型管継手装置である。

【0019】

【作用】従って、本発明の請求項1に記載の開閉弁付きプラグイン接続型管継手装置においては、開閉弁機構部を開弁、閉弁操作することで、これに連繋作動されるカム手段によって、開弁操作時には、該開弁作動と共に、解放手段を拘束係止して誤操作が防止され、閉弁操作時には、該閉弁作動と共に、解放手段を拘束解除し得る。

【0020】また、本発明の請求項1に記載の開閉弁付きプラグイン接続型管継手装置においては、開閉弁機構部を開弁、閉弁操作することで、これに連繋作動されるカム手段によって、開弁操作時には、該開弁作動と共に、解放手段を拘束係止して誤操作が防止され、且つパージ手段をパージ閉止させ、閉弁操作時には、該閉弁作動と共に、解放手段を拘束解除し、且つパージ手段をパージ開放し得る。

【0021】

【実施例】以下、本発明に係る開閉弁付きプラグイン接続型管継手装置の各別の実施例につき、図1ないし図18を参照して詳細に説明する。

【0022】第1実施例装置図1ないし図5は、本発明の第1実施例を適用した第1の基本的な開閉弁付きプラグイン接続型管継手装置を示すものであって、図1は、非接続による閉弁状態の概要構成を示す全体縦断面図、図2は、同上側面図、図3は、同上誤操作防止用カム板部の平面略図であり、また、図4は、接続に伴う開弁状態の概要構成を示す全体縦断面図、図5は、同上側面図、図6は、同上誤操作防止用カム板部の平面略図である。

【0023】本第1実施例装置は、管継手本体内に対して、内部流路を開閉する開閉弁機構部と、雄型継手部材をプラグイン接続させる雌型継手部材の継手機構部と、二次側の流体圧をパージする流体圧パージ機構部とをそれぞれに組み込むと共に、開閉弁機構部の開弁操作に連繋して、該開弁作動と同時に、雄型継手部材の拘束作用と、二次側での流体圧パージ閉止作用とを得られるようにし、また、開閉弁機構部の閉弁操作に連繋して、該閉弁作用と同時に、雄型継手部材の解放作用と、二次側での流体圧パージ開放作用とを得られるように構成したものである。

【0024】即ち、図1ないし図6に示す第1実施例装置において、開閉弁付きプラグイン接続型管継手装置は、管継手本体1を設けると共に、該管継手本体1内にそれぞれ組み込まれて流路を開閉する開閉弁機構部11と、外部の雄型継手部材41をプラグイン接続させる継手機構部21と、流体圧パージ機構部31とで構成される。

【0025】前記管継手本体1は、図1に示されている如く、前記開閉弁機構部11側に対応して六角筒状、前記継手機構部21側と流体圧パージ機構部31側とに対応して円筒状に形成され、且つ軸方向内部に内部流路2を形成すると共に、例えば、流体圧発生源等に装着される接続管3を螺着した内端部側に、該接続管3の内部流路4に連通する連通空間5と外周の六角筒状面1aに開口する弁軸孔6とを形成してあり、また、外端部側の

内側に、段部7を隔ててシールリング8を設け、さらに、前記内部流路4の中間部に、外周の円筒状面1bに開口する複数のパージ孔9を形成してある。

【0026】また、前記開閉弁機構部11には、本第1実施例の場合、前記管継手本体1内に独立的に組み込まれて外部から開閉操作可能な球弁(ボールバルブ)による開閉弁を用いており、前記連通空間5内に固定的に内装される弁座部材12と、該弁座部材12内に回動自在に嵌挿されて所要方向に弁流路13aを形成した球弁部材13と、該球弁部材13に対して回動し得るようにスリット係合され、且つ弁シール14aを介して前記弁軸孔6から外部に取り出された弁軸14と、該弁軸14の外部に取り出された軸部にバネ座金等を介して一体的に装着される後述の誤操作防止用カム板15及び弁回動角規制手段を配した弁操作ハンドル16とをそれぞれに有しており、該誤操作防止用カム板15と弁操作ハンドル16を前記弁軸14上に止めナット17で一体化固定してある。

【0027】ここで、図2及び図3に示されている如く、前記誤操作防止用カム板15は、前記球弁部材13の開弁方向に倣った誘導カム面15aと、該誘導カム面15aに接続した規制カム面15bとを形成してあり、また、前記弁操作ハンドル16の弁回動角規制手段としては、前記管継手本体1の外周の六角筒状面1aを利用して前記球弁部材13の回動角、つまり、閉弁位置と開弁位置とを規制する規制突片16aを折曲してある。

【0028】従って、前記構成による開閉弁機構部11の場合、図1ないし図3に示す非接続閉弁状態では、前記管継手本体1の軸線方向に対し、前記弁操作ハンドル16の規制突片16aが六角筒状面1aの一端面側に衝接する位置、ここでは直交位置まで回動されて前記球弁部材13を閉弁位置に作動させると共に、前記誤操作防止用カム板15の規制カム面15bが規制位置から離れて直角位置を占める非規制位置に移動且つ保持される。

【0029】続いて、図4ないし図6に示す接続開弁状態では、前記管継手本体1の軸線方向に対し、前記弁操作ハンドル16の規制突片16aが六角筒状面1aの他端面側に衝接する位置、ここでは平行位置まで、該弁操作ハンドル16が回動され、前記球弁部材13を開弁位置に作動させると共に、前記誤操作防止用カム板15の規制カム面15bが非規制位置に移動して保持されることになる。

【0030】前記継手機構部21は、図1に示されている如く、前記管継手本体1の外端部側に螺着された拘束部材22と、該拘束部材22の内周面に摺動自在に嵌装される雌型継手部材23と、該拘束部材22の外周面に摺動自在に嵌装される解放部材24とを有している。

【0031】ここで、前記拘束部材22には、外端部側の内周面内側と外周面内側とにそれぞれ押止面22a、22bを形成してあり、且つ該各押止面22a、22bに隣接する内側の係合穴22cに複数の係合ボール25を嵌挿してある。

【0032】また、前記雌型継手部材23は、外端面に拘束面23aを形成し、且つ内周面にテーパ面23b、外周面に押し出し面23cをそれぞれに形成した環状をなしている。そして、本雌型継手部材23は、前記管継手本体1の外端面との間に外周面側で押圧バネ26を介装させることにより、前記拘束部材22の押止面22aに拘束面23aを当接させて、その摺動が拘束されると共に、押し出し面54jが前記拘束部材53の各係合ボール25を外周側に押し出して一部露出させる。なお、この場合、本雌型継手部材23に押圧作用を加える前記押圧バネ26については、先に述べた従来の場合のように弁部の閉止を兼ねるものではなく、単に該雌型継手部材23のみを弾圧するのみであるから、強力な押圧力を保持する必要はない。

【0033】さらに、前記解放部材24は、外端面側の内側に斜面状のカム面24aを形成し、且つ該カム面24aに接続する内端面側の内周面に押圧面24b、内端面に内端縁24cをそれぞれ形成してある。そして、本解放部材24は、前記管継手本体1の外端面との間に内周面側で押圧バネ27を介装させることにより、前記拘束部材22の外周側に一部露出される各係合ボール25に対してカム面24aを当接押圧する。

【0034】一方、前記管継手本体1内の雌型継手部材23にプラグイン接続される雄型継手部材41は、図3に示されている如く、軸方向内側に二次側の内部流路42を形成すると共に、接続端部側から、前記シールリング8でシールされる外周面41a、前記テーパ面23bに当接されるテーパ面41b及び前記各係合ボール25を係合させる係合溝41cをそれぞれに形成してある。

【0035】従って、前記構成による継手機構部21の場合、図1ないし図3に示す非接続閉弁状態では、雌型継手部材23に対する雄型継手部材41のプラグイン接続がなされてはならず、押圧バネ26により、前記雌型継手部材23の拘束面23aが拘束部材22の内周面側の押止面22aに当接されると共に、押し出し面23cが前記拘束部材22の各係合ボール25を外周側に押し出して一部露出させ、且つ押圧バネ27により、解放部材24が外端面側へ押圧されてカム面24aを各係合ボール25の露出部分に当接させることで、該解放部材24を開弁位置に維持している。

【0036】続いて、図4ないし図6に示す接続開弁状態では、前記非接続閉弁状態において雌型継手部材23に対し、外端部側から押圧バネ26の押圧力に抗して雄型継手部材41の接続端部側を押し込むことにより、該雄型継手部材41の外周面41aが前記管継手本体1内のシールリング8でシールされ、且つテーパ面41bが前記雌型継手部材23のテーパ面23bに当接されると共に、該雌型継手部材23の押し出し面23cの移動に伴い、前記拘束部材22の各係合ボール25の拘束が解かれた後に、押圧バネ27で押圧されている解放部材24のカム面24aのカム作用により、該各係合ボール25が前記雄型継手部材41の係合溝41cに落ち込んで係合され、且つ該解放部材24が開弁位置に移動して押圧面24bで保持され、さらに、カム面24aが外周面側の押止面22bに衝接されて接続開弁状態に移行するもので、この接続開弁状態において、流体は、内部流路2の一次側から、弁部を隔てた二次側を経て、同二次側の内部流路42に流れることになる。

【0037】また、前記接続開弁状態から再度、非接続閉弁状態に移行させるのには、前記開弁位置に移動している解放部材24を押圧バネ27の押圧力に抗して閉弁位置に移動させればよく、該解放部材24の閉弁位置への移動によって、前記各係合ボール25の係合溝41cへの係合が解放されるために、前記雌型継手部材23が押圧バネ26の押圧力で自動的に元の状態に復帰して閉弁作用が果たされるのであり、該閉弁状態では、前記雌型継手部材23から雄型継手部材41を容易に抜き取り得るのである。

【0038】次に、前記流体圧パージ機構部31は、前記管継手本体1の円筒状面1b上に摺動自在に嵌装されると共に、内周面上にあって、前記接続開弁状態で前記各パージ孔9を跨いで周面シールをなし、且つ前記非接続閉弁状態で該周面シールを解除する位置に一組のシールリング33を設けた筒状パージ部材32を有しており、該筒状パージ部材32における外端面側相当の外端縁32aが、前記接続開弁状態で、前記解放部材24の内端縁24cに当接可能とされ、また、内端面側相当の内端縁32bが、前記非接続閉弁状態で、前記弁操作ハンドル16に連動する誤操作防止用カム板15に誘導されて移動した後、規制カム面15bに当接されて該移動位置に保持されるようになっている。

【0039】従って、前記構成による流体圧パージ機構部31の場合、図1ないし図3に示す非接続閉弁状態では、雌型継手部材23に対する雄型継手部材41のプラグイン接続がなされてはならず、解放部材24が閉弁位置に維持されているので、筒状パージ部材32の各シールリング33による各パージ孔9の周面シールがなされてはならず、弁操作ハンドル16が閉弁位置にあるために、誤操作防止用カム板15の規制カム面15bによる規制も受けてはいない。

【0040】また、図4ないし図6に示す接続開弁状態では、前記雌型継手部材23に対する雄型継手部材41のプラグイン接続がなされており、前記弁操作ハンドル16が開弁位置に作動されることで、前記筒状パージ部材32は、前記誤操作防止用カム板15に誘導されて所期位置に移動されると共に、規制カム面15bに規制されて各シールリング33による各パージ孔9の周面シールがなされ、同時に前記解放部材24が開弁位置に移動且つ拘束されて誤操作防止作用が果たされることになる。

【0041】以上のように、本第1実施例構成による開閉弁付きプラグイン接続型管継手装置においては、管継手本体1の雌型継手部材23への雄型継手部材41のプラグイン接続がなされると、該雄型継手部材41に対して、継手機構部21の係合拘束による接続状態の維持がなされ、且つ該接続状態で開閉弁機構部11を開弁操作すると、前記管継手本体1内の内部流路2と雄型継手部材41内の二次側内部流路42間が連通されて開弁状態に移行すると共に、該開閉弁機構部11の開弁作動に連繋して流体圧パージ機構部31の拘束作動がなされることで、前記二次側内部流路内のパージ作用が自動的に閉止され、併せて、同時に前記継手機構部21の接続状態もまた自動的に拘束されることになり、以後、前記開閉弁機構部11を開弁操作しない限り、該接続状態の解放が不能にされる。

【0042】また、前記開弁状態のまま、前記開閉弁機構部11を開弁操作すると、前記管継手本体1内の内部流路2と雄型継手部材41内の二次側内部流路42間が遮断されて閉弁状態に移行すると共に、該閉弁作動に連繋して前記流体圧パージ機構部31の拘束解放がなされることで、該流体圧パージ機構部31の作動、ひいては、前記継手機構部21の作動が共に可能になり、この結果、前記継手機構部21を解放作動することによって、同時に前記流体圧パージ機構部31もまた自動的に作動され、前記二次側内部流路内のパージ作用が果たされた後、前記雌型継手部材23から前記雄型継手部材41を極めて容易に抜き取り得るのである。

【0043】第2実施例装置図7及び図8は、本発明の第2実施例を適用した開閉弁付きプラグイン接続型管継手装置を示すものであって、図7は、非接続による閉弁状態の概要構成を示す全体縦断面図であり、また、図8は、接続に伴う開弁状態の概要構成を示す全体縦断面図である。

【0044】本第2実施例装置は、前記第1実施例装置の構成において、前記開閉弁機構部11にコックタイプの開閉弁、即ち、この場合、前記内部流路2内を横切って弁流路18a付きのコック状弁体部材18を用いたものであり、第1実施例装置と同様もしくはほぼ同様な作用効果が得られる。

【0045】第3実施例装置図9ないし図14は、本発明の第3実施例を適用した第2の基本的な開閉弁付きプラグイン接続型管継手装置を示すものであって、図9は、非接続による閉弁状態の概要構成を示す全体縦断面図、図10は、同上側面図、図11は、同上誤操作防止用カム板部の平面略図であり、また、図12は、接続に伴う開弁状態の概要構成を示す全体縦断面図、図13は、同上側面図、図14は、同上誤操作防止用カム板部の平面略図である。

【0046】本第3実施例装置は、前記第1実施例装置の構成において、前記流体圧パージ機構部31を省略し、且つ前記開閉弁機構部11によって、その開弁作動時に前記雄型継手部材41の拘束規制をなし得るようにしたものであり、前記流体圧パージ機構部31による作用効果が得られないほかは、第1実施例装置と同様な作用効果が得られる。

【0047】第4実施例装置図15及び図16は、本発明の第4実施例を適用した開閉弁付きプラグイン接続型管継手装置を示すものであって、図13は、非接続による閉弁状態の概要構成を示す全体縦断面図であり、また、図14は、接続に伴う開弁状態の概要構成を示す全体縦断面図である。

【0048】本第4実施例装置は、前記第1実施例装置の構成において、前記開閉弁機構部11にコックタイプの開閉弁、即ち、この場合、前記内部流路2内を横切って弁流路18a付きのコック状弁体部材18を用いると共に、前記流体圧パージ機構部31を省略し、且つ前記開閉弁機構部11によって、その開弁作動時に前記雄型継手部材41の拘束規制をなし得るようにしたものであり、前記流体圧パージ機構部31による作用効果が得られないほかは、第1実施例装置と同様もしくはほぼ同様な作用効果が得られる。

【0049】第5実施例装置図17及び図18は、本発明の第5実施例を適用した開閉弁付きプラグイン接続型管継手装置を示すものであって、図15は、非接続による閉弁状態の概要構成を示す全体縦断面図であり、また、図16は、接続に伴う開弁状態の概要構成を示す全体縦断面図である。

【0050】本第5実施例装置は、前記第1実施例装置の構成において、前記開閉弁機構部11にバタフライタイプの開閉弁、即ち、この場合、前記連通空間5内を横切ってバタフライ状弁体部材19を用いると共に、前記流体圧パージ機構部31を省略し、且つ前記開閉弁機構部11によって、その開弁作動時に前記雄型継手部材41の拘束規制をなし得るようにしたものであり、前記流体圧パージ機構部31による作用効果が得られない場合は、第1実施例装置と同様もしくはほぼ同様な作用効果が得られる。

【0051】

【発明の効果】以上、各実施例によって詳述したように、本発明によれば、管継手本体の内部流路に設けられる雌型継手部材に対し、外部の雄型継手部材をプラグイン接続させる管継手装置において、管継手本体内部に、内部流路を開閉する開閉弁を有し、且つ該開閉弁の開閉作動に連動するカム手段を備えた開閉弁機構部と、雌型継手部材への雄型継手部材の接続状態を保持する係合手段、及び該係合手段の保持を解除する解放手段を備えた継手機構部とを組み込んで構成し、また、必要に応じては、該構成に流路内の二次側流体圧をパージするパージ手段を備えた流体圧パージ機構部を組み込んで構成し、開閉弁機構部の開弁、閉弁の各操作に連繫作動されるカム手段によって、開弁操作時にあっては、開弁作動に合わせて解放手段の拘束係止をなし、また、パージ手段のパージ閉止をなし、閉弁操作時にあっては、閉弁作動に合わせて解放手段の拘束解除をなし、また、パージ手段のパージ開放をなし得るようにしたので、開閉弁機構部による内部流路の開弁、閉弁と、継手機構部による雌型継手部材への雄型継手部材の接続保持、接続解放との各作用、また、流体圧パージ機構部による二次側流体圧のパージ閉止、パージ開放との各作用を相互に独立的で、且つ相互に関連して自動的に行なうことができるのであり、しかも、このように独立的な構成では、該各機構部の個々の構造を全体的に簡略化し得て、操作自体が極めて容易になり、特に、継手機構部の雌型継手部材に対する雄型継手部材の接続保持、接続解放により以上の操作力を必要とせず、該操作を少ない操作力で円滑且つ迅速になし得る等の優れた特長を有するものである。

図の説明

【図面の簡単な説明】

【図1】本発明の第1実施例を適用した第1の基本的な開閉弁付きプラグイン接続型管継手装置の非接続閉弁状態の概要構成を示す全体縦断面図である。

【図2】同上第1実施例での非接続閉弁状態の側面図である。

【図3】同上第1実施例での非接続閉弁状態における誤操作防止用カム板部の平面略図である。

【図4】同上第1実施例での接続開弁状態の概要構成を示す縦断面図である。

【図5】同上第1実施例での接続開弁状態の側面図である。

【図6】同上第1実施例での接続開弁状態における誤操作防止用カム板部の平面略図である。

【図7】本発明の第2実施例を適用した開閉弁付きプラグイン接続型管継手装置の非接続閉弁状態の概要構成を示す全体縦断面図である。

【図8】同上第2実施例での接続開弁状態の概要構成を示す全体縦断面図である。

【図9】本発明の第3実施例を適用した第2の基本的な開閉弁付きプラグイン接続型管継手装置の非接続閉弁状態の概要構成を示す全体縦断面図である。

【図10】同上第3実施例での非接続閉弁状態の側面図である。

【図11】同上第3実施例での非接続閉弁状態における誤操作防止用カム板部の平面略図である。

【図12】同上第3実施例での接続開弁状態の概要構成を示す全体縦断面図である。

【図13】同上第3実施例での接続開弁状態の側面図である。

【図14】同上第1実施例での接続開弁状態における誤操作防止用カム板部の平面略図である。

【図15】本発明の第4実施例を適用した開閉弁付きプラグイン接続型管継手装置の非接続閉弁状態の概要構成を示す全体縦断面図である。

【図16】同上第4実施例での接続開弁状態の概要構成を示す全体縦断面図である。

【図17】本発明の第5実施例を適用した開閉弁付きプラグイン接続型管継手装置の非接続閉弁状態の概要構成を示す全体縦断面図である。

【図18】同上第5実施例での接続開弁状態の概要構成を示す全体縦断面図である。

【図19】従来例による開閉弁付きプラグイン接続型管継手装置の概要構成を非接続閉弁状態と接続開弁状態とに半截して示す全体縦断面図である。

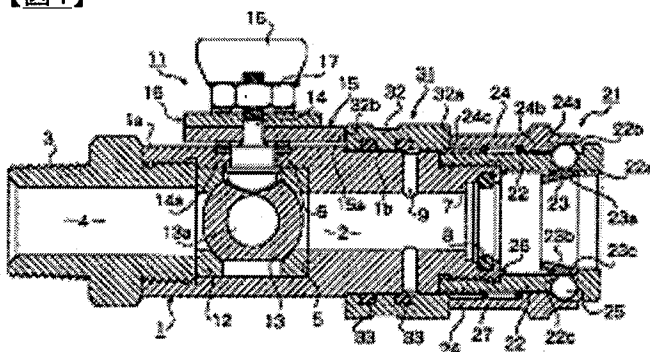
【符号の説明】

- 1 管継手本体
- 1a 六角筒状面
- 1b 円筒状面
- 2、4 内部流路
- 3 接続管

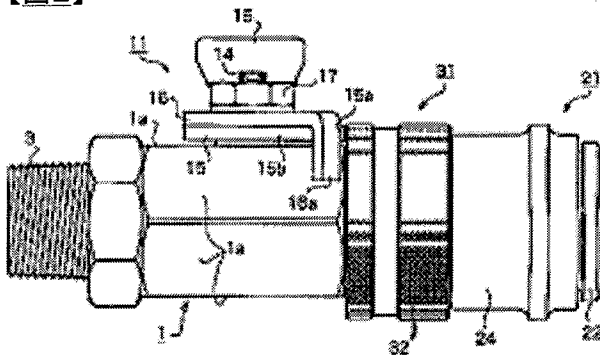
- 5 連通空間
- 6 弁軸孔
- 7 段部
- 8 シールリング
- 9 パージ孔
- 11 開閉弁機構部
- 12 弁座部材
- 13 球弁部材
- 13a 弁流路
- 14 弁軸
- 14a 弁シール
- 15 誤操作防止用カム板
- 15a 誘導カム面
- 15b 規制カム面
- 16 弁操作ハンドル
- 16a 規制突片
- 17 止めナット
- 18 コック状弁体部材
- 18a 弁流路
- 19 バタフライ状弁体部材
- 21 継手機構部
- 22 拘束部材
- 22a、22b 押止面
- 22c 係合穴
- 23 雌型継手部材
- 23a 拘束面
- 23b テーパー面
- 23c 押し出し面
- 24 解放部材
- 24a カム面
- 24b 押圧面
- 24c 内端縁
- 25 係合ボール
- 26、27 押圧バネ
- 31 流体圧パージ機構部
- 32 筒状パージ部材
- 32a 外端縁
- 32b 内端縁
- 33 シールリング
- 41 雄型継手部材
- 41a 外周面
- 41b テーパー面
- 41c 係合溝
- 42 内部流路

図面

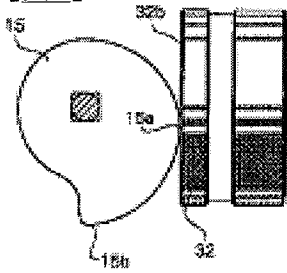
【図1】



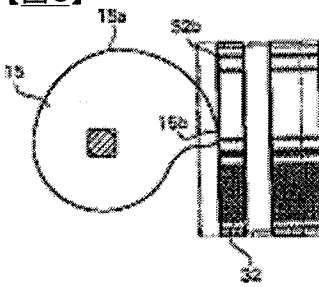
【図2】



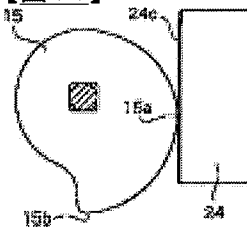
【図3】



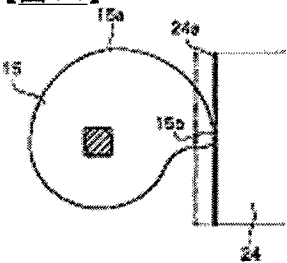
【図6】



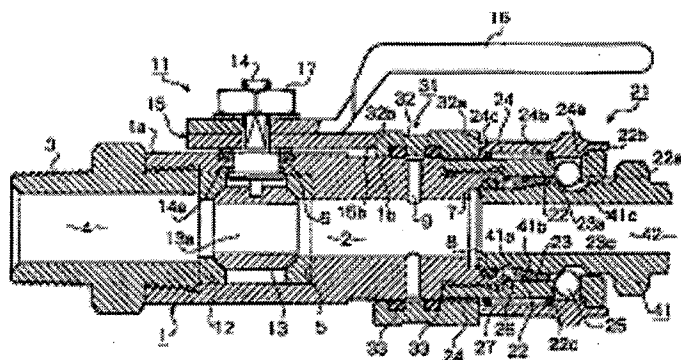
【図11】



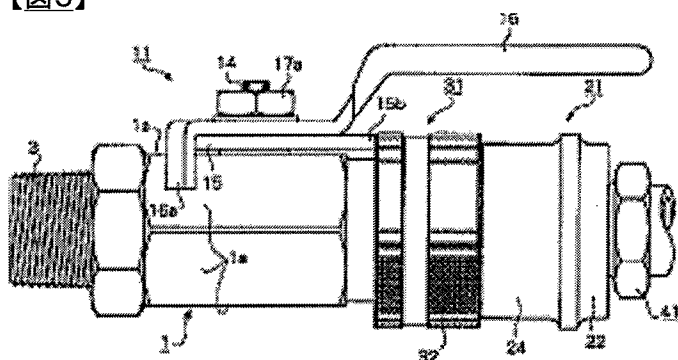
【図14】



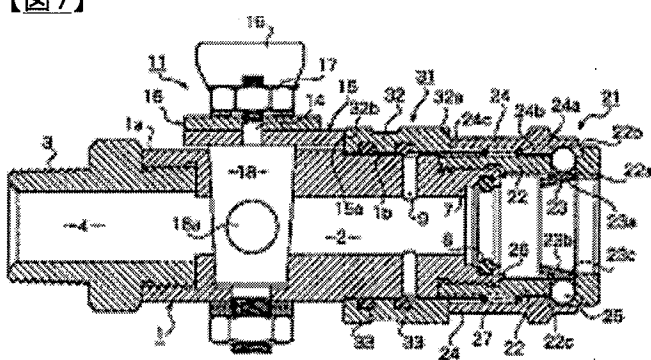
【図4】



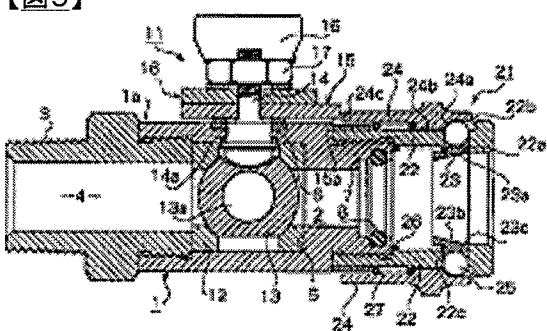
【図5】



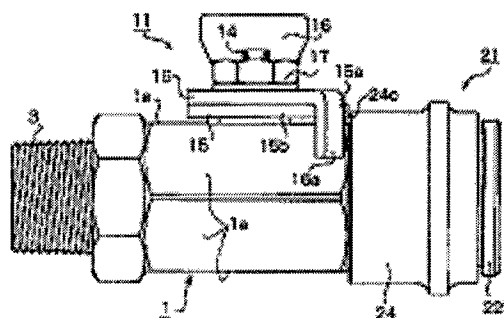
【図7】



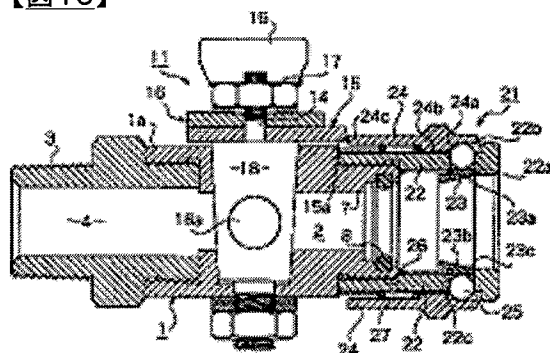
【図9】



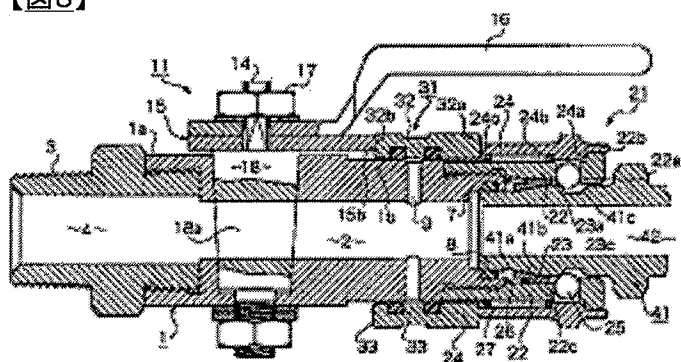
【図10】



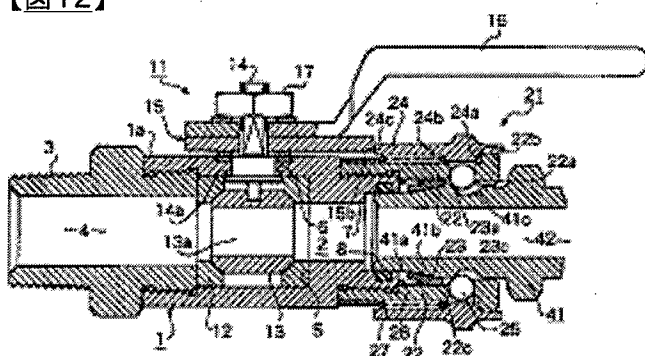
【図15】



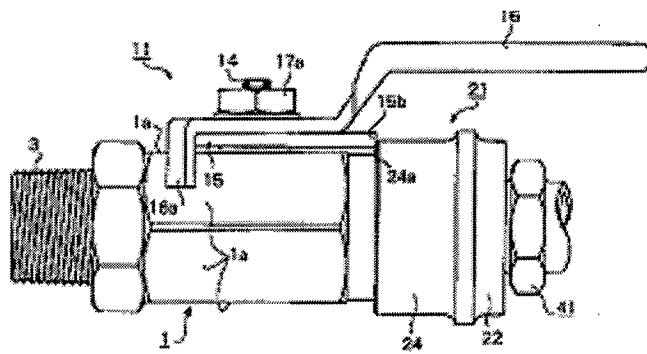
【図8】



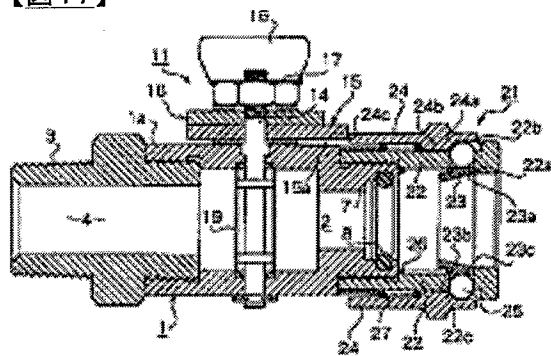
【図12】



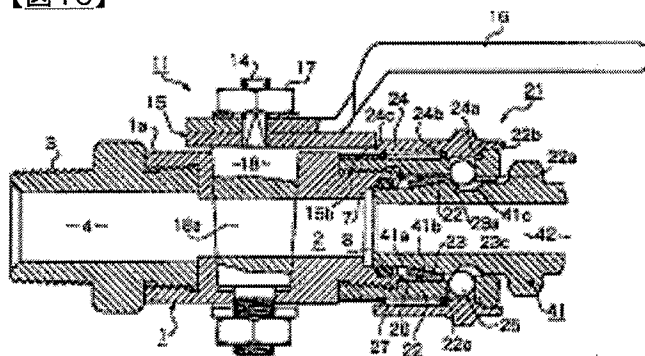
【図13】



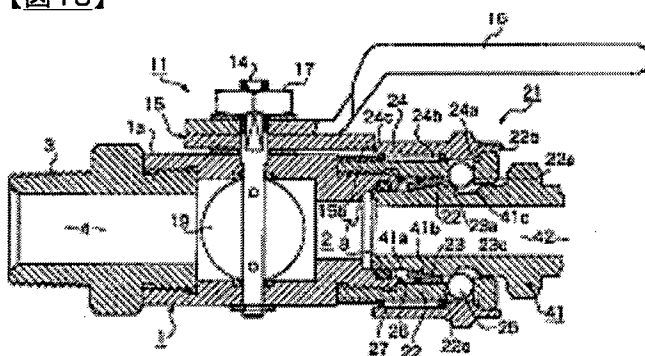
【図17】



【図16】



【図18】



【図19】

